

Amendment to the Claims:

Please cancel claims 11, 12, 15 to 22, 32, 34 to 37, 47, 50 to 57, 66 to 80, 87 to 99, 111 to 115, 122 to 131, and 134 to 169, without prejudice.

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An isolated or recombinant nucleic acid comprising a nucleotide sequence selected from the group consisting of ~~SEQ ID NO:1, the complement of SEQ ID NO:1, SEQ ID NO:3, the complement of SEQ ID NO:3, SEQ ID NO:5, the complement of SEQ ID NO:5, SEQ ID NO:7, the complement of SEQ ID NO:7, SEQ ID NO:9, the complement of SEQ ID NO:9, SEQ ID NO:11, the complement of SEQ ID NO:11, SEQ ID NO:13, and the complement of SEQ ID NO:13.~~

Claim 2 (currently amended): An isolated or recombinant nucleic acid at least 95% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 3 (currently amended): An isolated or recombinant nucleic acid at least 90% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 4 (currently amended): An isolated or recombinant nucleic acid at least 80% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 5 (currently amended): An isolated or recombinant nucleic acid at least 70% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 6 (currently amended): An isolated or recombinant nucleic acid at least 60% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 7 (currently amended): An isolated or recombinant nucleic acid at least 50% identical to a sequence of a nucleic acid of claim 1 as determined by analysis with a sequence comparison algorithm or by visual inspection.

Claim 8 (currently amended): An isolated or recombinant nucleic acid that hybridizes to a nucleic acid of claim 1 under conditions of high stringency.

Claim 9 (currently amended): An isolated nucleic acid that hybridizes to a nucleic acid of claim 1 under conditions of moderate stringency.

Claim 10 (currently amended): An isolated or recombinant nucleic acid that hybridizes to a nucleic acid of claim 1 under conditions of low stringency.

Claims 11 and 12 (canceled)

Claim 13 (currently amended): The isolated or recombinant nucleic acid of claim 1, wherein the nucleotide sequence [[selected has the]] comprises a nucleotide sequence set forth as SEQ ID NO:3.

Claim 14 (currently amended): The isolated or recombinant nucleic acid of claim 1, wherein the nucleotide sequence [[selected has the]] comprises a nucleotide sequence set forth as the complement of SEQ ID NO:3.

Claims 15 to 22 (canceled)

Claim 23 (currently amended): The isolated or recombinant nucleic acid of claim 1, wherein the nucleotide sequence [[selected has the]] comprises a nucleotide sequence set forth as SEQ ID NO:13.

Claim 24 (currently amended): The isolated or recombinant nucleic acid of claim 1, wherein the nucleotide sequence [[selected has the]] comprises a nucleotide sequence set forth as the complement of SEQ ID NO:13.

Claim 25 (currently amended): An expression vector comprising [[:]] the nucleic acid of claim [[1]] 2.

Claim 26 (original): The expression vector of claim 25 further comprising an expression control nucleotide sequence.

Claim 27 (currently amended): A host cell transformed with the nucleic acid of claim [[1]] 2.

Claim 28 (original): The host cell of claim 27 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 29 (currently amended): A host cell comprising the expression vector of claim [[23]] 25.

Claim 30 (original): The host cell of claim 29 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 31 (currently amended): An isolated or recombinant nucleic acid comprising a nucleotide sequence encoding a polypeptide having an amino acid sequence selected from the group consisting of [[SEQ ID NO:2,]] SEQ ID NO:4, ~~SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12,~~ and SEQ ID NO:14.

Claim 32 (canceled)

Claim 33 (currently amended): The isolated or recombinant nucleic acid of claim 31 encoding the polypeptide having the amino acid sequence set forth as SEQ ID NO:4.

Claims 34 to 37 (canceled)

Claim 38 (currently amended): The isolated or recombinant nucleic acid of claim 31 encoding the polypeptide having the amino acid sequence set forth as SEQ ID NO:14.

Claim 39 (currently amended): An expression vector comprising the isolated or recombinant nucleic acid molecule of claim 31.

Claim 40 (original): The expression vector of claim 39 further comprising an expression control nucleotide sequence.

Claim 41 (currently amended): A host cell transformed with the isolated or recombinant nucleic acid molecule of claim 31.

Claim 42 (original): The host cell of claim 41 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 43 (original): A host cell comprising the expression vector of claim 39.

Claim 44 (original): The host cell of claim 43 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 45 (currently amended): An isolated or recombinant nucleic acid comprising a nucleotide sequence encoding a polypeptide having at least thirty contiguous amino acids of a ~~[[protein]]~~ polypeptide having an amino acid sequence selected from the group consisting of ~~[[SEQ ID NO:2,]] SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12,~~ and SEQ ID NO:14.

Claim 46 (currently amended): The isolated or recombinant nucleic acid of claim 45 comprising a nucleotide sequence encoding a polypeptide having at least thirty contiguous amino acids of SEQ ID NO:2.

Claim 47 (canceled):

Claim 48 (currently amended): The isolated or recombinant nucleic acid of claim 45 comprising a nucleotide sequence encoding a polypeptide having at least thirty contiguous amino acids of SEQ ID NO:4.

Claim 49 (currently amended): The ~~[[phytase protein]]~~ isolated or recombinant nucleic acid of claim 45 ~~[[having]]~~ wherein the polypeptide has an amino acid sequence comprising SEQ ID NO:4.

Claims 50 to 57 (canceled)

Claim 58 (currently amended): The isolated or recombinant nucleic acid of claim 45 comprising a nucleotide sequence encoding a polypeptide having at least thirty contiguous amino acids of SEQ ID NO:14.

Claim 59 (currently amended): The ~~[[phytase protein]]~~ isolated or recombinant nucleic acid of claim 45 ~~[[having]]~~ wherein the polypeptide has an amino acid sequence comprising SEQ ID NO:14.

Claim 60 (currently amended): An expression vector comprising the isolated or recombinant nucleic acid of claim 45.

Claim 61 (original): The expression vector of claim 60 further comprising an expression control nucleotide sequence.

Claim 62 (currently amended): A host cell transformed with the isolated or recombinant nucleic acid of claim 45.

Claim 63 (original): The host cell of claim 62 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 64 (original): A host cell comprising the expression vector of claim 60.

Claim 65 (original): The host cell of claim 64 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claims 66 to 80 (canceled)

Claim 81 (currently amended): A nucleic acid expression vector comprising a nucleotide sequence encoding a polypeptide having at least 95% sequence identity to a sequence as set forth in SEQ ID NO:4 or SEQ ID NO:14 [[the phytase protein of claim 66]].

Claim 82 (original): The expression vector of claim 81 further comprising an expression control nucleotide sequence.

Claim 83 (currently amended): A host cell transformed with the nucleotide sequence encoding a polypeptide having at least 95% sequence identity to a sequence as set forth in SEQ ID NO:4 or SEQ ID NO:14 [[the phytase protein of claim 66]].

Claim 84 (original): The host cell of claim 83 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 85 (original): A host cell comprising the nucleic acid expression vector of claim 81 and an expression control nucleotide sequence.

Claim 86 (original): The host cell of claim 85 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claims 87 to 99 (canceled)

Claim 100 (currently amended): A nucleic acid expression vector comprising a nucleotide sequence encoding a polypeptide having at least 95% sequence identity to a sequence as set forth in SEQ ID NO:4 or SEQ ID NO:14 ~~the phytase protein of claim 87.~~

Claim 101 (original): The expression vector of claim 100 further comprising an expression control nucleotide sequence.

Claim 102 (currently amended): A host cell comprising a nucleotide sequence encoding a polypeptide having at least 95% sequence identity to a sequence as set forth in SEQ ID NO:4 or SEQ ID NO:14 ~~transformed with the nucleotide sequence encoding the phytase protein of claim 87.~~

Claim 103 (original): The host cell of claim 102 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 104 (currently amended): A host cell comprising the nucleic acid expression vector of claim ~~[[86]]~~ 100.

Claim 105 (original): The host cell of claim 104 selected from the group consisting of a bacterium, a fungus, a plant or an animal cell.

Claim 106 (currently amended): A nucleic acid expression vector comprising: (a) a nucleotide sequence encoding a polypeptide having at least thirty contiguous amino acids of a protein having an amino acid sequence selected from the group consisting of ~~[[SEQ ID NO:2,]] SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:14;~~ and (b) an expression control nucleotide sequence.

Claim 107 (original): The nucleic acid expression vector of claim 106, wherein the expression control nucleotide sequence is a constitutive promoter.

Claim 108 (original): The nucleic acid expression vector of claim 106, wherein the expression control nucleotide sequence is a tissue-specific promoter.

Claim 109 (original): The nucleic acid expression vector of claim 106, wherein the nucleotide sequence of (a) further comprises a nucleotide sequence encoding a signal peptide.

Claim 110 (original): The nucleic acid expression vector of claim 109, wherein the signal peptide is the PR protein PR-S signal peptide from tobacco.

Claims 111 to 115 (canceled)

Claim 116 (currently amended): A method to produce an animal feed comprising: (a) transforming a plant, plant part or plant cell with the nucleic acid expression vector of claim ~~[[86]]~~ 106; (b) culturing the plant, plant part or plant cell under conditions in which ~~[[the]]~~ a phytase ~~[[protein]]~~ is expressed; and (c) converting the plant, plant parts or plant cell into a composition suitable for animal feed.

Claim 117 (original): The method of claim 116, wherein in the animal is a monogastric animal.

Claim 118 (original): The method of claim 116, wherein the animal is a ruminant.

Claim 119 (currently amended): A non-human transgenic organism comprising a heterologous nucleic acid encoding a polypeptide having at least thirty contiguous amino acids of a ~~[[protein]]~~ polypeptide having an amino acid sequence selected from the group consisting of ~~[[SEQ ID NO:2,]] SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:14.~~

Claim 120 (currently amended): The non-human transgenic organism of claim 119 ~~[[that], wherein the organism]~~ is a plant.

Claim 121 (currently amended): The plant according to claim 120, wherein the ~~[[phytase amino acid]]~~ polypeptide is expressed in a seed.

Claims 122 to 131 (canceled)

Claim 132 (currently amended): A feed composition comprising: (a) a plant, plant part, or plant cell expressing a polypeptide having at least thirty contiguous amino acids of a protein having an amino acid sequence selected from the group consisting of ~~[[SEQ ID NO:2,]] SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:14;~~ and (b) a phytate-containing foodstuff.

Claim 133 (original): The feed composition of claim 132, wherein the plant part is a seed or portion thereof.

Claims 134 to 169 (canceled)

Claim 170 (currently amended): An isolated nucleic acid encoding a phytase protein having an amino acid sequence selected from the group consisting of [[SEQ ID NO:2,]] ~~SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, SEQ ID NO:12,~~ and SEQ ID NO:14 optimized for codon usage in an organism.

Claim 171 (original): The nucleic acid of claim 170 optimized for expression in a bacterium, a plant, a fungus or an animal.

Claim 172 (currently amended): The nucleic acid of claim 171 optimized for codon usage in an organism selected from the group consisting of *S. pombe*, *S. cerevisiae*, *Pichia pastoris*, [[*Psuedomonas*]] *Pseudomonas* *sp.*, *E. coli*, *Streptomyces sp.*, *Bacillus sp.*, *Lactobacillus sp.*